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## PATENT ABSTRACTS OF JAPAN

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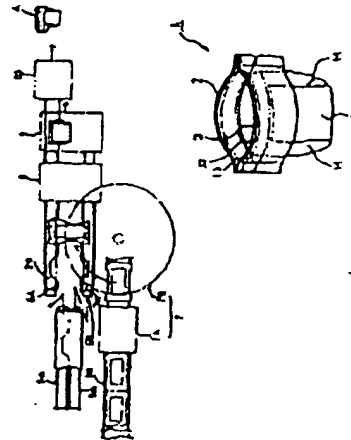
(54) MANUFACTURE OF BRIEFS TYPE DISPOSABLE  
DIAPER

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(57) Abstract:

**PURPOSE:** To reduce costs by enabling an automatic large-scale production method by forming a back body wrapping part and front body wrapping sections to place a diaper main body thereon orthogonally and to bond it thereto.

**CONSTITUTION:** Optional stock is selected for a back body wrapping section and front body wrapping sections (2 and 3) independently of diaper body 1. In other words, the diaper body 1 is relayed to a turning transfer device 7B behind a suction conveying device 7A and the diaper body 1 is turned by 90° to be supplied to a specified position between belt bodies 2a and 3a of both body wrapping sections perpendicular thereto. Then the diaper body is conveyed to a bonding means 8 to bond it integrally with the belt bodies 2a and 3a of both body wrapping sections. Thereafter, the assembly is conveyed to a folding means 9 to be folded double and side ends of the belt bodies 2a and 2b of both the body wrapping sections are cut while being bonded by a bonding/cutting means 10.



*full translation attached  
No equiv. outside Japan*

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LAID OPEN PATENTS GAZETTE (A)

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### Specification

#### 1. Title of the invention

Brief-type disposable diaper production method

#### 2. Scope of the patent claim

A brief-type disposable diaper production method involving

a process whereby a water-absorbent material is inserted between an outer sheet and an inner sheet to form a diaper body;  
a process whereby a front waistband and a continuous back waistband having an elastic member at least at the side is formed;

a process whereby the diaper body is overlapped and adhered to both waistbands in the transverse direction;

a process whereby the diaper body is folded double and both waistbands are brought into contact; and

a process whereby the contacted waistbands are cut to prescribed dimensions and the regions near the cuts are adhered to integrate the waist parts at the edge portions

to produce a brief-type disposable diaper from a diaper body and a single waistband.

#### 3. Detailed description of the invention

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### Field of industrial use

The present invention relates to a brief-type disposable diaper production method.

### Prior art

Known technology relating to this type of brief-type disposable diaper production method is disclosed in Japanese Unexamined Patent Application Number S57-77304: "Diaper-brief and Production Method Therefor".

### Problems to be overcome by the invention

The abovementioned technology is disadvantageous in that as there is a cut-out portion in order to form an opening for the wearer to insert his/her legs, it is necessary to add a process for forming the cut-out portion, which raises production costs.

### Means of overcoming the abovementioned problem

The present invention overcomes the abovementioned problem of the prior art and allows the production of brief-type disposable diapers by an automated large-scale production method involving a process whereby a diaper body is formed; a process whereby a back waist part and front waist part are formed; a process whereby the diaper body is overlapped and adhered to both waist parts in the transverse direction; and a process whereby the diaper body is adhered and integrated.

### Embodiment

The present invention is described in detail based on the embodiment shown in the following drawings.

Figures 4 through 6 show an example of a brief-type disposable diaper produced according to the present invention: 1

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represents the diaper body, formed by inserting absorbent material 13 between outer sheet (for example, a water-impermeable P.E. sheet) 11 and inner sheet (for example, water permeable nonwoven cloth) 12.

2 is the back waist part and 3 is the front waist part, and the material for both waist parts 2 and 3 may be selected independently from the material for diaper body 1, although in this embodiment, the same material is used; the double layer having P.E. sheets 21 and 31 as the outside and nonwoven cloth 22 and 32 as the inside is formed, an elastic member sheet (for example, a polyurethane sheet) 23 and 33 is inserted into part thereof, so that at least the upper edge is expandable. It should be noted that it is also possible to have a single layer elastic sheet, to form a completely expandable construction. It should be noted that as waist parts 2 and 3 are preferably of an air-permeable material, it is desirable either to take the nonwoven cloth and elastic sheet, and exclude the P.E. sheet, or, when a P.E. sheet is used, to puncture a plurality of small holes therein. It is also possible to totally or partially affix the elastic member (rubber thread, rubber tape or the like) to a sheet of suitable material, to form an elastic sheet.

Moreover, the hole parts H for the insertion of the wearer's legs are dictated by the width and shape of the diaper body 1 and the width and shape of waist parts 2 and 3, and generally, the shape is such that the holes are toward the front side.

The brief-type disposable diaper production method of the

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present invention will be described below with reference to Figures 1 through 3.

Figure a shows the diaper body 1 production process: absorbent body 13 is placed on outer sheet (back sheet) 11 supplied from outer sheet roller 11a, then inner sheet (top sheet) 12, supplied from inner sheet roller 12a, is supplied thereon, to achieve a sandwich-like insertion of absorbent body 1 between outer sheet 11 and inner sheet 12; then this is transported by the first conveyor device 4 to adhering-cutting device 15, and the circumference is firmly adhered by adhering-cutting device 15, or adhered with adhesive, then cut to the required shape. It should be noted that this process is the same as known diaper production processes, and it is possible to employ a conventional production line for disposable diapers.

It should be noted that the adhering-cutting device 15 comprises two stages: first unit 15a and second unit 15b. In first unit 15a, only adhesion and the cutting of cut-away parts P proceeds, to continuously form diaper body 1, then diaper body band 1a is transported to the next process, and may be cut crosswise to the required dimensions by second unit 15b when in the vicinity of the waistbands 2,3-adhesion process.

Moreover, as there are no cut-away parts P when diaper body 1 is long, it is also possible to achieve the aims of the present invention by only adhering in first unit 15a, then cutting in second unit 15b.

There are various possible shapes for the cut-away parts P, and the shape can be selected according to the shape of the

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waistband 2,3 and the desired shape of hole parts H.

Figure 1(b) shows a waistband 2, 3 production line: elastic member sheet 23a, supplied by elastic member sheet roller 14, is cut along a continuous S-shaped cutting line in the central portion by cutting device 24 to form a pair of bands, back waistband 2a and front waistband 3a.

It should be noted that in the case of the multilayer constructions shown in Figure 3 (outer sheet (P.E. sheet) and elastic member sheet, inner sheet (nonwoven cloth) and elastic member sheet, or outer sheet and elastic member sheet-inner sheet), if elastic member sheet 23a is a band of the same width, and only part of sheet 21a, 22a is adhered, the elastic member sheet can be used effectively without cut-away parts, and holes of the desired shape can be found by selecting a suitable shape for waist part 2,3.

Figure 1(c) integrates the diaper body 1 process of Figure 1(a) and the waistband 2a, 3a process of Figure 1(b), to show the brief-type disposable diaper-forming process: the second conveying device 5a, 5b for waistbands 2a, 3a extends to become the third conveying device 6A and the force conveying device 6B.

Diaper body supply means 7 comprises suction conveying device 7A and rotation conveying device 7B, such that suction conveying device 7A for conveying the diaper body 1 that has been cut to the required dimensions is provided at the end of the first conveying device 4, after which diaper body 1 proceeds onto rotation conveying device 7B, then rotation conveying device 7B rotates the diaper body 1 through 90°, to supply diaper body 1

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transversely to a prescribed position on waistband 2a, 3a.

It should be noted that rotation conveying device 7B receives the diaper body 1 on the conveying surface of suction conveying device 7A then supplies it by rotating 1/4 of a rotation while suction continues, then rotating the diaper body 1 that is between third conveying device 6A and fourth conveying 6B through 90°, and diaper body supply means 7 can achieve the aim by means of a suitable conveying means as follows: the adsorption surface of the diaper body is rotated through 90° according to the rotation of a suction rotation drum provided so as to be continuous with suction conveying device 7A, then the diaper body proceeds to a suction conveyor belt, whereupon it is conveyed in a transverse direction with respect to the conveying devices, thereby allowing diaper body 1 to be supplied between waistbands 2 and 3.

Diaper body 1 is then conveyed to adhesion means 8 and adhered to waistbands 2a, 3a by a suitable adhesion means such as an adhesive or heat seal.

It is then conveyed to folding means 9, and folded double by said folding means 9 to superimpose front waistband 2a and back waistband 3a.

The sides of the superimposed waistbands 2a and 2b are adhered and cut to the required shape by adhering-cutting means 10, to yield brief-type disposable diaper A.

#### Advantages of the invention

The present invention yields a brief-type disposable diaper by adhering and integrating a pair of waistbands and a



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diaper body and cutting to the required dimensions and so conventional diaper production lines can be used for the diaper body, the waist parts are supplied as bands and automated mass production is possible due to a belt conveying device, so the brief-type disposable diapers can be effectively produced at extremely low cost.

#### 4. Brief description of the drawings

Figure 1 is an explanatory diagram for the brief-type disposable diaper production method of the present invention: Figure (a) shows the diaper body production process, and Figure (b) shows the waistband-integrating process.

Figure 2 is a diagram of the diaper body, and Figure 3 shows the front waist part and back waist part.

Figure 4 shows an oblique view of a brief-type disposable diaper produced according to the present invention, Figure 5 is plane view and Figure 6 is a cross-sectional view of the diaper body.

- |    |                          |
|----|--------------------------|
| 1  | Diaper body              |
| 2  | Back waist part          |
| 3  | Front waist part         |
| 7  | Diaper body supply means |
| 8  | Adhesion means           |
| 9  | Folding means            |
| 10 | Cutting means            |

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送圖平3-170053 (2)

月夜に於て寧ろつを置けし、又又性理の上と謂ふ  
處を離れてもこのためなり。

OXFORD

以下四圖に於て、 $\gamma$  及び  $\theta$  にもついて、 $\alpha$  無變を  
假定す。

第4図乃至第6図は本発明により製造されたブリーフ型衣の側面を穿つの一例を示し、1は肩口つばはで、外装シート（例えば、非透水性シートであるP. E. シート）11と内装シート12（例えば、透水性シートである不織布）とで、縫合部13を隔み込んで形成されている。

2 は片側傾斜9度、3 は側傾斜9度であり、  
傾斜角9度2・3は、おむつ本体1とは接合して  
任意の厚みを選択できるが、実施例ではおむつ本  
体1と同様の厚みを使用し、片側をP、E、シー  
ト21・31、内面を不織布22・32とする二  
層構造とし、その一端に側傾斜シート（例えば、  
ポリウレタンシート）23・33を張り込み、少  
なくとも上層膜においては延縮性のある構造とし  
た。なお、側傾斜シートの上層構造とし全面膜

電シートと土との間に挟み込んだ後、作業切羽位置に両側鋼材を逆戻しにより移送し、作業切羽位置により両辺鋼材を地盤内、または両側鋼材で覆着して所定厚さに切断する。2台、全鋼材の互ひつの逆送工程と同様であり、従来の電ひつておひつの逆送ラインを適用することができる。

なれ、後述の調査より、第1ユニット15  
aと第2ユニット13bとの2段階構成とし、第1  
ユニット15aでは両者とともに明暗成分の切  
断のみを行なって、最終段におむつ交換しを形成  
して、おむつ交換用紙15を改工程に送り込み  
換装用紙形成段2-3との両者工程の両方におい  
て、第2ユニット13bにより両者両方に用定す  
紙段に切断してもよい。

また、各つづ本体1の形成を異方引伸とする場合には、明確な分界が存在しないので、第1ユニット130では異質のみを問う。第2ユニット130で明確することにより証明を達成することが出来る。

**३६. राजस्थान के राज्यपाल, श्रीमती सुश्री कल्याण**

に押込みのある構造としてもよいことは明かである。なお、図面図り番 2・3 は、通気性のある構造が望ましいので、P、E、シートを糊いて不透過と製造図 1 シートとするか、P、E、シートを糊いる場合にほ多少の小孔を製造させることが望ましい。また、通気・導熱シートに、ゴム系、ゴム・プラスチックの複合体、金属箔に被覆した被覆材、導熱シートとガラス繊維に夾り着いた被覆材の更を挿入するための開口部は、片方だけ開口の形状及び形状の選択と、図面図り番 2・3 の形状及び形状の選択により決定され、一般的に図面 1 に図 1 の形状とする方がよい。

次に、第1回乃至第3回を要約して、本報紙に  
よるブリーフお便いにておなつの製造方法を説明  
する。

a 鋼は、各ウエッジの貫通工程を終し、内張  
 シートロール 1.1a より供給される内張シート  
 (バックシート) 1.1 上に、電板 1.3 を張設し、  
 その上に、内張シートロール 1.2a より供給され  
 る内張シート (トップシート) 1.2 を供給して、  
 マンディップ板に電板 1.1 を内張シート 1.1 と内

2・3の月にはH及びHより大きい開口部Hの月並みに  
より幾々のものが選別されるものである。

第1図の如きは、同様に傾斜度2・3の2ラインを示し、傾斜度1シートロール14より取れた傾斜度1シート23を明確な24により巾中央部の道線3枚幅域で明確して一片の道線は引成し、一方を傾斜度より道線18とし、西方を同様に傾斜度3ととする。

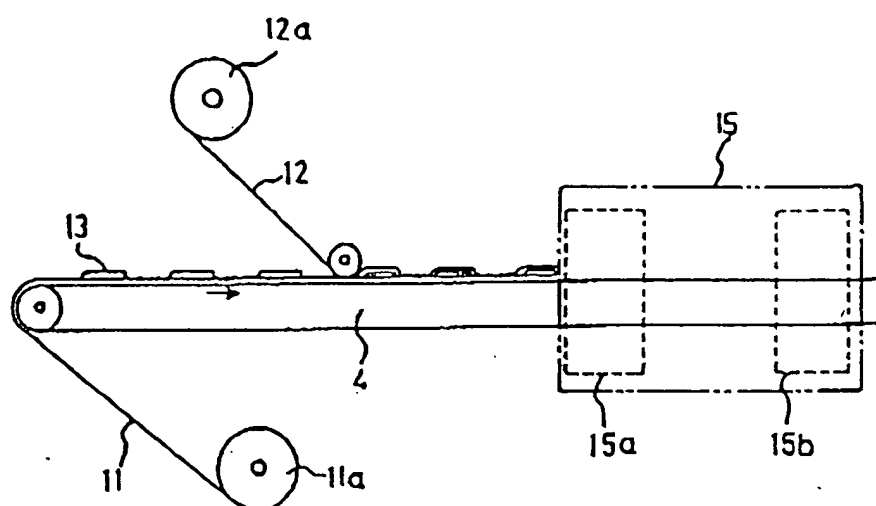
なお、第1層に於ては、外被シート（P、E、シート）と内被紙材シート、内被シート（不織布）と内被紙材シート、または外被シートと内被紙材シート内被シートとの多層積層とする場合には、内被紙材シート21aを同一層の内被紙材シートとし、シート21a・22aの一部にのみ内被紙材シートを効果的に明瞭部分とせしめることとなく）使用がでる、且つ両面うち第2・3の明被を任意に選択し、無しの明被の開口部を明被することとされて居る。

例 1 例の  $\alpha$  列は、 $a$  個の  $\alpha$  の並びと、 $b$  個の  $\beta$  の並びより成る故に  $2a \cdot 2b$  とを、一様化して、

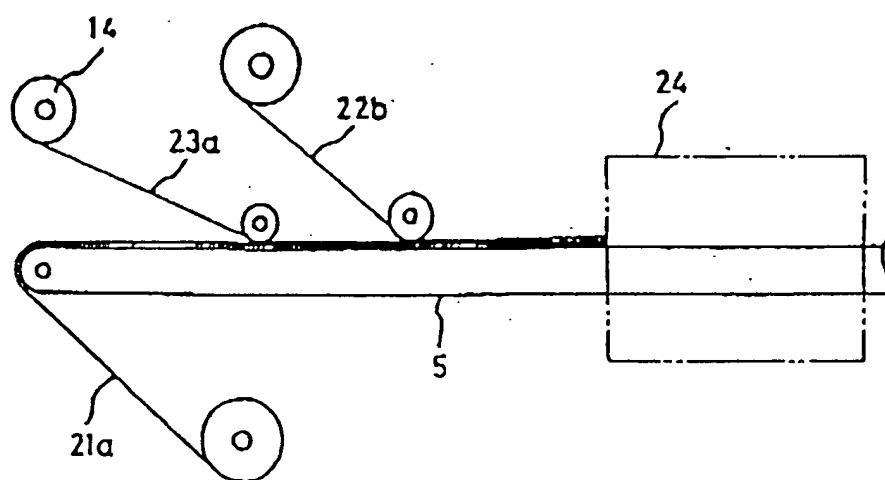


特開平3-176053(4)

第1図 (a)

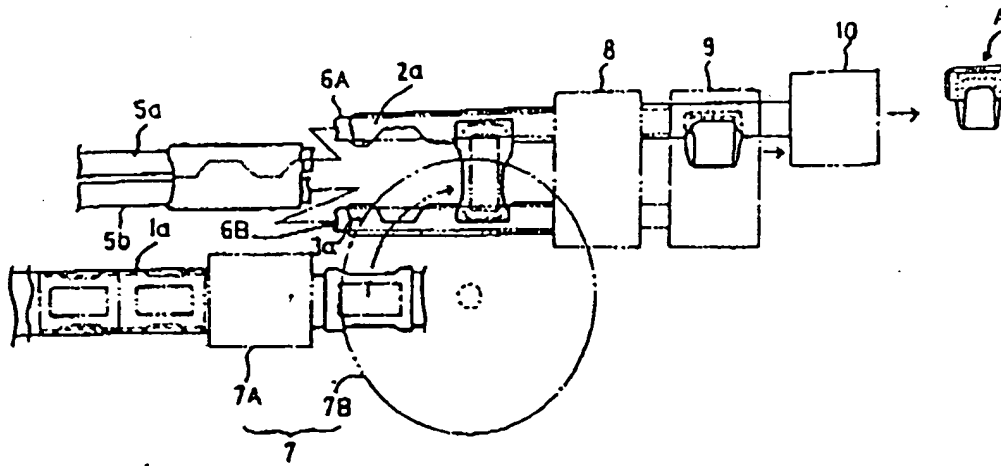


第1図 (b)

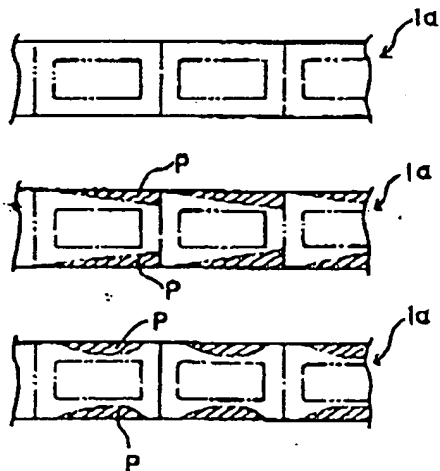


特開平3-170053(5)

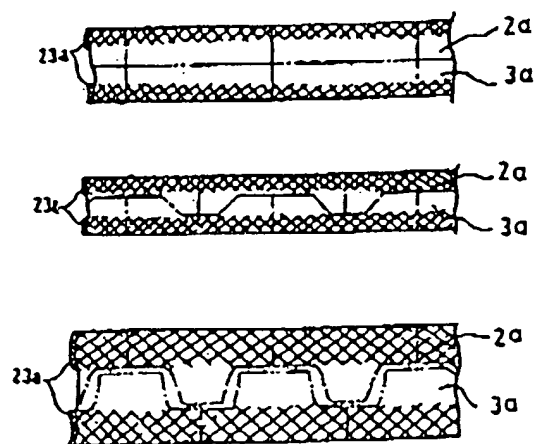
第1図(C)



第2図

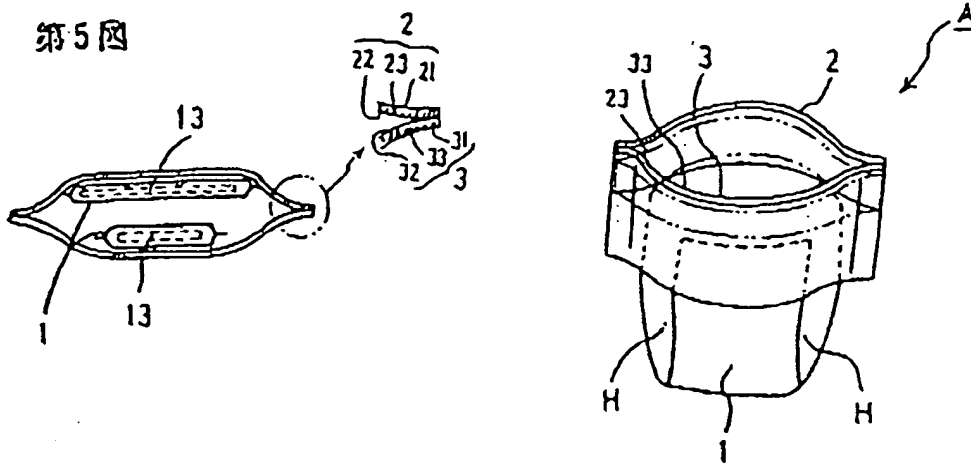


第3図



13 00 3-176053 (6)

第4图



第6图

